

Symptomatic Occipital-Vertebral Anastomosis

A Case Report

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Summary

Occipital-vertebral anastomosis (O-V anastomosis) is a common collateral anastomosis between the external carotid and the vertebro-basilar system. But symptomatic O-V anastomosis is rare. We report a case with syncope and vertebrobasilar insufficiency caused by O-V anastomosis. It was thought that the vertebral steal phenomenon through this anastomotic channel caused these symptoms.

Introduction

Occipital-vertebral anastomosis (O-V anastomosis) is one of the most common collateral pathways between the external carotid and the vertebro-basilar system¹⁻⁴. Usually this anastomosis causes no symptoms and is incidentally demonstrated on cerebral angiogram in cases with carotid or vertebral arterial occlusive disease.

In this paper, we report a rare case with syncope and dizziness that were thought to be caused by O-V anastomosis.

Case report

A 47-year-old woman lost consciousness for a few minutes after headache on one day in April 1997. Subsequently, she had recurrent episodes of dizziness. She lost consciousness again on September 27, 1997 and was admitted to our hospital on September 29, 1997.

On admission, neurological examination revealed no abnormalities. Cerebral angiogram showed a direct anastomotic artery between the left occipital and the third segment of the left vertebral artery (figure 1). It was noted that the direction of blood flow of this anastomotic channel was from the vertebral artery to the distal occipital artery.

No intracranial vascular lesion was found. Brain CT, MRI and EEG showed no abnormalities and no general disorders causing unconsciousness could be found. We therefore thought that the patient's symptoms might be caused by intracranial steal phenomenon resulting from this O-V anastomosis, although single-photon emission computerized tomography failed to show a decrease of blood flow in the territory of the vertebrobasilar system.

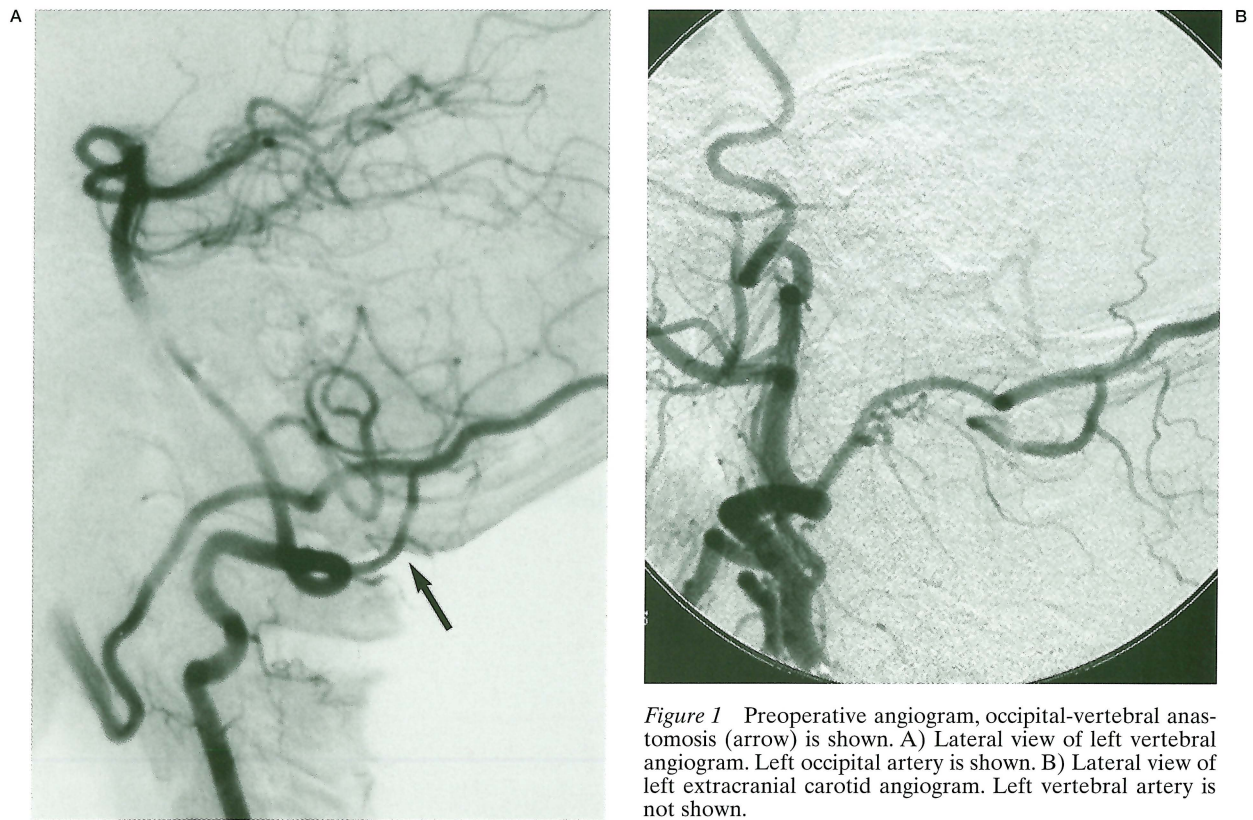


Figure 1 Preoperative angiogram, occipital-vertebral anastomosis (arrow) is shown. A) Lateral view of left vertebral angiogram. Left occipital artery is shown. B) Lateral view of left extracranial carotid angiogram. Left vertebral artery is not shown.

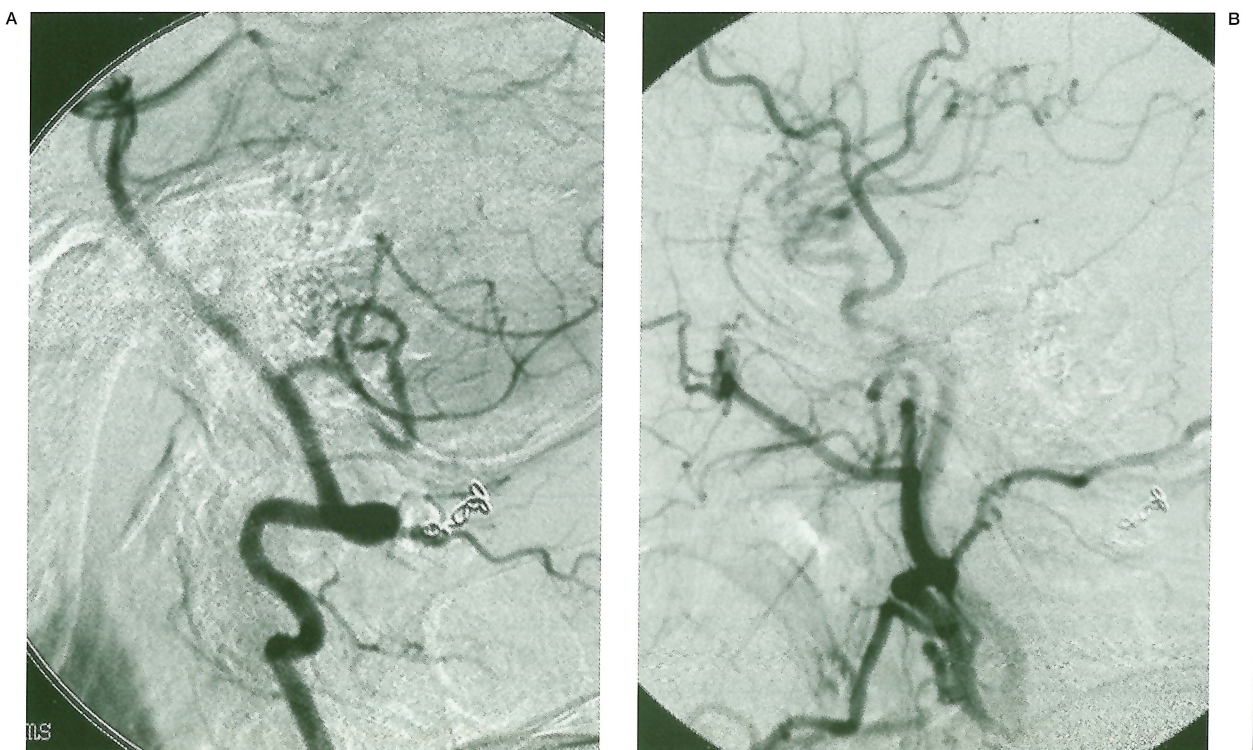


Figure 2 Postoperative angiogram, occipital-vertebral anastomosis was obliterated with platinum coils. A) Lateral view of left vertebral angiogram. B) Lateral view of left extracranial carotid angiogram.

We decided to observe her medically and she repeated syncope and dizziness attacks frequently during eight months after discharge. She was admitted again to undergo interventional treatment. The anastomotic channel was endovascularly disconnected with platinum coils, resulting in successful obliteration of the O-V anastomosis (figure 2). Her symptoms of syncope and dizziness attacks completely disappeared.

Discussion

O-V anastomosis is not uncommon¹⁻⁴ and often found angiographically in patients with occlusion of the carotid or vertebral artery. Schechter² reported four cases with vascular lesion among 1000 cases of cerebral angiogram. On the other hand, the incidence of O-V anastomosis without any cerebral vascular lesions was reported to be from 0.17 to 4 %²⁻⁴.

However, a case with symptomatic O-V anastomosis is rare. Kondo⁵ reported that a case with O-V anastomosis causing vertebrobasilar insufficiency underwent surgical obliteration of this anastomotic channel and the patient's symptoms disappeared. We could not find a case with symptomatic O-V anastomosis except this report.

In the present case, the direction of blood flow was from vertebral to the distal occipital artery through this anastomosis.

We therefore hypothesized that this anastomotic channel resulted in the intracranial steal phenomenon, causing syncope and dizziness attacks. Disappearance of the patient's symptoms after treatment may account for this hypothesis.

Endovascular occlusion of this anastomotic channel is an effective treatment for a case with symptomatic O-V anastomosis repeating syncope and dizziness.

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EDITORIAL COMMENT

The authors present an interesting clinical experience of symptomatic improvement after embolisation of C1 anastomosis which exists as a normal variation or potential collateral channel in cases where there is an occlusion at the proximal level of the external carotid and vertebral arteries¹. The direction of the dominant flow is a very interesting point when the C1 anastomosis persists between the C1 muscular branches of the occipital and vertebral arteries.

A different flow pattern is well known in Doppler examinations, revealing that the diastolic gradient in the vertebral artery is higher than that of the external carotid artery because of the low diastolic flow component due to the high peripheral resistance in the supply territory. This is characteristic of the external carotid artery in contrast to the vertebral artery with its high diastolic component². Theoretically, the diastolic gradient from the vertebral artery to the occipital artery may contribute to the preferential flow, leading to a "steal" type of phenomenon in the vertebral artery.

However, occlusion of the anastomotic channel by a risky embolisation procedure should remain a last therapeutic option as indicated in this report, and should be carried out only after excluding all other possible causes of the patient's symptoms. If performed, careful follow-up is necessary after this embolisation procedure.

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